UNITED STATES PATENT AND TRADEMARK OFFICE

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P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER
THIRUGNANAM, GANDHI

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/552,053	DE HAAN, GERARD
	Examiner	Art Unit	
	GANDHI THIRUGNANAM	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>04 October 2005</u>.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-15</u> is/are pending in the application.

　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-15</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>04 October 2005</u> is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　a) ☒ All b) ☐ Some * c) ☐ None of:

　　1. ☐ Certified copies of the priority documents have been received.

　　2. ☐ Certified copies of the priority documents have been received in Application No. _____.

　　3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Remarks

1.   The response received on 04 October 2005 has been placed in the file and was

considered by the examiner. An action on the merits follows.

       Claims 1-13 are pending.

       The pending application is the national stage entry of

PCT/IB04/50371 filed 03/31/2004.

       There are co-pending applications (10/552056, 10/530376, 10/560006) relating

to similar inventions. It appears that 10/552056 and 10/560006 are distinct enough to

not be considered double patenting. Application 10/530376 has been abandoned,

otherwise a obvious type double patenting rejection would have been put forward.

       It appears that Applicant's specification is moving between the summary of the

invention to the Background of the Invention, without giving a clear flow of what is the

actual invention. Applicant may have not properly incorporated by reference the

documents listed in the application (for example of page 6).

Specification

2.   The disclosure is objected to because of the following informalities:

3.   Applicant is reminded of the proper language and format for an abstract of the
disclosure.

       The abstract should be in narrative form and generally limited to a single
paragraph on a separate sheet within the range of 50 to 150 words. It is important that
the abstract not exceed 150 words in length since the space provided for the abstract
on the computer tape used by the printer is limited. The form and legal phraseology
often used in patent claims, such as "means" and "said," should be avoided. The

abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The Abstract should not have references to parts in the figures

Appropriate correction is required.

Content of Specification

(a)   Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the specification unless the title is provided in an application data sheet. The title of the invention should be brief but technically accurate and descriptive, preferably from two to seven words may not contain more than 500 characters.

(b)   Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.

(c)   Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.

(d)   The Names Of The Parties To A Joint Research Agreement: See 37 CFR 1.71(g).

(e)   Incorporation-By-Reference Of Material Submitted On a Compact Disc: The specification is required to include an incorporation-by-reference of electronic documents that are to become part of the permanent United States Patent and Trademark Office records in the file of a patent application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text were permitted as electronic documents on compact discs beginning on September 8, 2000.

(f)   Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:

(1) <u>Field of the Invention</u>: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."

(2) <u>Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98</u>: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."

(g) <u>Brief Summary of the Invention</u>: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.

(h) <u>Brief Description of the Several Views of the Drawing(s)</u>: See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.

(i) <u>Detailed Description of the Invention</u>: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.

(j) <u>Claim or Claims</u>: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR

1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).

(k)   <u>Abstract of the Disclosure</u>: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).

(l)   <u>Sequence Listing,</u> See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

Claim Objections

4.   Claims 1-13 are objected to because of the following informalities:

The claims (claim 1-13) should not have references to parts in the figures.

Claims 2-10 and 12-13 recite "An image conversion …". The Examiner suggests "The image conversion …"

Appropriate correction is required.

CFR 1.105 – Requirement for Information

5.   Applicant and the assignee of this application are required under 37 CFR 1.105 to provide the following information that the examiner has determined is reasonably necessary to the examination of this application.

Applicant has referred to the following publications (see below), in their

disclosure. The Examiner has attached a copy of what he believes that these

publications refer. Applicant is <u>required</u> to confirm/deny that these are indeed the

applications referred to in the disclosure. If not, then a copy must be supplied.

"Towards an overview of spatial up-conversion techniques",
by Meng Zhao et al., in the proceedings of the ISCE 2002,
Erfurt, Germany, 23-26 Sep. 2002.

"Edge adaptive filtering: how much and which direction?",
by R. Jha and M. E. Jernigan, in the proceedings of IEEE
International Conference on Man and Cybernetics, 1989, 14-17
November page 364-366 vol. 1.

"True-Motion Estimation with 3-D Recursive Search Block
Matching" by G. de Haan et. al. in IEEE Transactions on circuits
and systems for video technology, vol. 3, no. 5, October 1993,
pages 368-379.

"Noise reduction in image sequences using motion
compensated temporal filtering", by E. Dubois and S. Sabri, in
IEEE, Transactions on Communication, no. 7, 1984, pp. 826-831.

Claim Rejections - 35 USC § 101

6.   35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows (see also MPEP 2106):

> Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

> When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

Claim 14 is rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. The Federal Circuit[1], relying upon Supreme Court precedent[2], has indicated that a statutory "process" under 35 U.S.C. 101 must (1) be tied to a particular machine or apparatus, or (2) transform a particular article to a different state or thing. This is referred to as the "machine or transformation test", whereby the recitation of a particular machine or transformation of an article must impose meaningful limits on the claim's scope to impart patent-eligibility (See *Benson*, 409 U.S. at 71-72), and the involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity (See *Flook*, 437 U.S. at

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[1] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

590"). While the instant claim(s) recite a series of steps or acts to be performed, the

claim(s) neither transform an article nor positively tie to a particular machine that

accomplishes the claimed method steps, and therefore do not qualify as a statutory

process. That is, a particular machine (either expressly or not recited) is absolutely

required to perform the significant steps. There is also no qualifying transformation, the

data does not represent a physical object. This process can be completed by hand on a

piece of paper.

The Examiner suggests amending the claim to include:

at the last line of the method independent claims "wherein the above steps are

computed by a processor" or in the first line of the body of the method independent

claims "computing the steps below using a processor", if so enabled by the

specification.

7.   35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent
Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV,
reads as follows (see also MPEP 2106):

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional
descriptive material." In this context, "functional descriptive material" consists of data structures and
computer programs which impart functionality when employed as a computer component. (The
definition of "data structure" is "a physical or logical relationship among data elements, designed to
support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and
Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited
to music, literary works and a compilation or mere arrangement of data.

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[2] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v.
Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

Claim 15 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 15 defines a "computer program product" embodying functional descriptive material (i.e., a computer program or computer executable code). However, the claim does not define a "computer-readable medium or computer-readable memory" and is thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). The scope of the presently claimed invention encompasses products that are not necessarily computer readable, and thus NOT able to impart any functionality of the recited program. The examiner suggests amending the claim(s) to embody the program on "computer-readable medium" or equivalent; assuming the specification does NOT define the computer readable medium as a "signal", "carrier wave", or "transmission medium" which are deemed non-statutory (refer to "note" below). Any amendment to the claim should be commensurate with its corresponding disclosure.

Note:

"A transitory, propagating signal … is not a "process, machine, manufacture, or composition of matter." Those four categories define the explicit scope and reach of subject matter patentable under 35 U.S.C. § 101; thus, such a signal cannot be patentable subject matter." (In re Nuijten, 84 USPQ2d 1495 (Fed. Cir. 2007). Should the full scope of the claim as properly read in light of the disclosure encompass non-statutory subject matter such as a "signal", the claim as a whole would be non-statutory. Should the applicant's specification define or exemplify the computer readable medium or memory (or whatever language applicant chooses to recite a computer readable medium equivalent) as statutory tangible products such as a hard drive, ROM, RAM, etc, **as well as** a non-statutory entity such as a "signal", "carrier wave", or "transmission medium", the examiner suggests amending the claim to _include_ the disclosed tangible computer readable storage media, while at the same time _excluding_ the intangible transitory media such as signals, carrier waves, etc.

Merely reciting functional descriptive material as residing on a "tangible" or other medium is not sufficient. If the scope of the claimed medium covers media other than "computer readable" media (e.g., "a tangible media", a "machine-readable media", etc.), the claim remains non-statutory. The full scope of the claimed media (regardless of what words applicant chooses) should not fall outside that of a computer readable medium.

It appears that a "computer program product" is merely software, which is non

statutory. The phrase following this is intended use and is given no weight. Page 6

Line 25 states "may be loaded via a network like Internet". This is further evidence that

a "computer program product" is software. The Examiner suggests adding "computer-

readable memory" into the claim.

8.   **Claims 1 and 11** are rejected under 35 U.S.C. 101 because the claimed

invention is directed to non-statutory subject matter as follows. Claim 1 defines a "unit".

However, it is not clear whether a "unit" indicates a system or apparatus. While the

preamble defines a "unit", which would appear be indicative of an "apparatus", the body

of the claim lacks definite structure indicative of a physical apparatus. Furthermore, the

specification indicates that the invention may be embodied as pure software Page 6

Line 25.   Therefore, the claim as a whole appears to be nothing more than a "system"

of software elements, thus defining functional descriptive material per se.

Functional descriptive material may be statutory if it resides on a "computer-

readable medium or computer-readable memory". The claim(s) indicated above lack

structure, and do not define a computer readable medium and are thus non-statutory for

that reason (i.e., "When functional descriptive material is recorded on some computer-

readable medium it becomes structurally and functionally interrelated to the medium

and will be statutory in most cases since use of technology permits the function of the

descriptive material to be realized" – Guidelines Annex IV). The scope of the presently

claimed invention encompasses products that are not necessarily computer readable,

and thus NOT able to impart any functionality of the recited program. The examiner
suggests:

    1.   Amending the claim(s) to embody the program on "computer-readable
medium" or equivalent; assuming the specification does NOT define the computer
readable medium as a "signal", "carrier wave", or "transmission medium" which are
deemed non-statutory; or

    2.   Adding structure to the body of the claim that would clearly define a
statutory apparatus.

    Any amendment to the claim should be commensurate with its corresponding
disclosure.

Note:

    "A transitory, propagating signal … is not a "process, machine, manufacture, or
composition of matter." Those four categories define the explicit scope and reach of
subject matter patentable under 35 U.S.C. § 101; thus, such a signal cannot be
patentable subject matter." (*In re Nuijten*, 84 USPQ2d 1495 (Fed. Cir. 2007)).

    Should the full scope of the claim as properly read in light of the disclosure
encompass non-statutory subject matter such as a "signal", the claim as a whole would
be non-statutory.   Should the applicant's specification define or exemplify the computer
readable medium or memory (or whatever language applicant chooses to recite a
computer readable medium equivalent) as statutory tangible products such as a hard
drive, ROM, RAM, etc, **as well as** a non-statutory entity such as a "signal", "carrier

wave", or "transmission medium", the examiner suggests amending the claim to _include_

the disclosed tangible computer readable storage media, while at the same time

excluding the intangible transitory media such as signals, carrier waves, etc.

Claim Rejections - 35 USC § 112

9.　　The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10.　　Claims 8-9 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

　　　　Claims 8 and 9 recites "components". It is not clear what "components" refers?

Claim Rejections - 35 USC § 102

11.　　The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12.　　Claims 1-13 rejected under 35 U.S.C. 102(b) as being anticipated by Well Known

Art.

　　　　Regarding **claims 1-13,**

　　　　It is not clear whether Applicant is invoking 35 USC 112 6th paragraph.

Applicant states on page 10 line 1, that the means used is of a "suitably programmed

computer". A computer is well known, and any computer can be programmed to do

different types of image processing such as Applicant's invention.

Claim Rejections - 35 USC § 103

13.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

14.   Claims 1-3 and 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable

over "Towards an overview of spatial up-conversion techniques", by Meng Zhao,

hereafter referred to as Zhao in view of "Edge adaptive filtering: how much and which

direction?", by R. Jha and M. E. Jernigan, hereafter referred to as Jha.

         Regarding **claim 1,** Zhao discloses an image conversion unit for converting a first

image with a first resolution into a second image with a second resolution being higher

than the first resolution, the image conversion unit comprising:

         - a coefficient-determining means for determining a first filter coefficient on basis

of pixel values of the first image; and *(Zhao, Section 1.A "To obtain the filter coefficients,*

a learning process should be performed in advance")

         - an adaptive filtering means for computing a second pixel value of the second

image on basis of a first one of the pixel values of the first image and the first filter

coefficient, *(Zhao, Section 2.A, "Classification of luminance blocks is realized by ADRC*

(Adaptive Dynamic Range Coding)", Equation (2) which shows the HI image generated

from a weighted filter (w) and the input image Fsd, where the weights are generated

from an error value (adapted by the error value))

Any one of the up-conversion algorithms described in Zhou discloses a

coefficient determining unit and an adaptive filtering unit, for example the DRC

algorithm, (also see Applicant's Specification page 6 Lines 11-19), but the algorithms

disclosed by Zhou do no disclose applying a low-pass filter to the intermediate result to

generate an output image.

"characterized in that the image conversion unit further comprises a low-pass

filter for filtering the second image." *(Jha, Section 3 "The filtered image is computed by*

taking the average of pixel values over the local window selected by the adaptation

process)

It would have been obvious to one of ordinary skill in the art at the time of

invention to modify Zhao with Jha for the purpose of restoring an image degraded by

noise (or processing).

Regarding **claim 2,** Zhao in view of Jha discloses an image conversion unit as

claimed in claim 1, characterized in that the image conversion unit comprises a feature

extraction unit for extracting features from the first image or the second image and that

the feature extraction unit is arranged to control the low-pass filter. *(Jha, Section 2, "In*

the vicinity of edges, smaller windows should be used to avoid collecting statistics from

a mixture of distributions", where the features are the edges)

Regarding **claim 3,** Zhao in view of Jha discloses an image conversion unit as

claimed in claim 2, characterized in that the feature extraction unit is an edge detector

unit for detecting edges in the first image. *(Jha, Section 2, "In the vicinity of edges,*
smaller windows should be used to avoid collecting statistics from a mixture of
distributions", where the features are the edges)

Regarding **claim 10,** Zhao in view of Jha discloses an image conversion unit as
claimed in claim 3, characterized in that the low-pass filter is an edge-adaptive spatial
low-pass filter. *(Jha, Section 3 "The filtered image is computed by taking the average of*
pixel values over the local window selected by the adaptation process) (Jha, Section 2,
"In the vicinity of edges, smaller windows should be used to avoid collecting statistics
from a mixture of distributions", where the features are the edges)

Regarding **claim 11,** Zhao in view of Jha discloses an image processing
apparatus, comprising:

- receiving means for receiving a signal corresponding to a first image; and
(Zhao, I, "standard definition (SD) video material")

- an image conversion unit for converting the first image into a second image, the
image conversion unit as claimed in claim 1. *(See Claim 1)*

Regarding **claim 12,** Zhao in view of Jha discloses an image processing
apparatus as claimed in claim 11, characterized in further comprising a display device
for displaying the low-pass filtered second image. *(Zhao, I, "HDTV")*

Regarding **claim 13,** Zhao in view of Jha discloses an image processing
apparatus as claimed in claim 11, characterized in that it is a TV. *(Zhao, I, "HDTV")*

Claims 14 and 15 are rejected under the same reasoning as claim 1.

15.   Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhao in view of Jha in further view of "True-Motion Estimation with 3-D Recursive Search Block Matching" by G. de Haan et. al., hereafter referred to as DeHaan.

Regarding **claim 4,** Zhao in view of Jha discloses an image conversion unit as claimed in claim 2,

Zhao and Jha discloses upsampling an image/video sequence and low pass filtering (spatial) the output image but does not discloses

"characterized in that the feature extraction unit is a motion detector unit for computing a value representing the amount of motion in the first image, relative to a third image of a series of images to which both the first image and the third image belong." *(DeHaan, Section III)*

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Zhao and Jha with DeHaan for the purpose of estimating motion, which can be used to correct an image.

Regarding **claim 5,** Zhao in view of Jha discloses an image conversion unit as claimed in claim 2,

Zhao and Jha discloses upsampling an image/video sequence and low pass filtering (spatial) the output image but does not discloses

"characterized in that the feature extraction unit is a motion estimation unit for computing motion vectors for respective groups of pixels of the first image, relative to

further groups of pixels of a third image of a series of images to which both the first image and the third image belong." *(DeHaan, Section III)*

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Zhao and Jha with DeHaan for the purpose of estimating motion, which can be used to correct an image.

Regarding **claim 6,** Zhao in view of Jha discloses an image conversion unit as claimed in claim 1,

Zhao and Jha discloses upsampling an image/video sequence and low pass filtering (spatial) the output image but does not discloses

"characterized in that the low-pass filter is a temporal filter." *(DeHaan, Section III)*

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Zhao and Jha with DeHaan for the purpose of estimating motion, which can be used to correct an image.

Regarding **claim 7,** Zhao in view of Jha discloses an image conversion unit as claimed in claim 6, characterized in that the low-pass filter is a temporal recursive filter comprising a motion compensation unit for motion compensation of a previously filtered image. *(DeHaan, Section III)*

16.   Regarding **claims 8 and 9**, No Prior Art has been found as the claims are currently written.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GANDHI THIRUGNANAM whose telephone number is (571)270-3261. The examiner can normally be reached on M-Th, 7:30am to 6pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh M. Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Gandhi Thirugnanam/
Examiner, Art Unit 2624
/Matthew C Bella/
Supervisory Patent Examiner, Art Unit 2624